

## **Meaningful Watershed Educational Experiences for Students**

- **Partners:**

- Valencia Elementary School, Aptos
- Monterey Bay National Marine Sanctuary (MBNMS) – *Citizen Watershed Monitoring Network “Network”*
- Life Lab Science Program
- Santa Cruz County Resource Conservation District (SCCRCD)

- **Target Audience:**

- The GO! Program served 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> grade students.
- Demographics: 13% English Learners, 22% low income
- The GO! Program worked with nearly two hundred forty students. The Program worked predominately with Valencia’s Science teacher, but retained contact with all seven homeroom teachers.

## **Goals & Objectives:**

- Provide learning experiences based upon the students' study of the watershed and to learn about their connectivity among people, watershed health and the ocean
- Engage students in water quality monitoring of Valencia Creek
- Teach students about the natural processes in the environment, including symbiotic relationships, the water cycle and geologic processes
- Increase students awareness and appreciation of the environment, with demonstrated and measurable increases in awareness and knowledge during the program year
- Create a sense of the importance of pollution prevention in riparian and coastal habitats through experiential learning
- Empower students and teachers to achieve a positive impact in their watershed and for the environment

## **Project Overview:**

- The 2006 - 2007 GO! (Get Outdoors!) Program supported hands-on outdoor educational experiences for students at Valencia Elementary School in Aptos, California
- The proximity to Valencia Creek, a tributary to Aptos Creek, allowed students to perform weekly water quality monitoring (parameters included: air and water temperature, pH, conductivity, dissolved oxygen & turbidity) and general observations
- Students gained important scientific knowledge by utilizing instruments made specifically for water monitoring. As well, students gained further knowledge about watersheds, human interaction and their connection to watershed health by engaging in classroom activities geared toward these topics
- Creek habitat clean up by students on an ongoing basis
- Data tracking via water quality monitoring data sheets and graphing projects
- Watershed Festival at end of school year for parents and students

## **Evaluation Plan:**

- Were tasks outlined in the project proposal completed during the course of the program?
- Was there sufficient student and teacher participation throughout the year?
- Were there measurable increases in student awareness and learning by the end of the program?
- Did the program make an impact on student population?
- Does the program have value based upon exam results, teacher surveys and student attitudes?

## **Tools and Methods used to measure objectives:**

- Written exams given to all students pre, mid and post program
- Exams covered all water quality monitoring parameters utilized in the field, as well as questions pertaining to pollution, watersheds and plants and animals found in a riparian environment

## **Products:**

- Utilization of Watershed Cruzin' and Waves, Wetlands and Watersheds Curriculum for indoor lessons/activities
- Utilization of Enviroscope's 3D Watershed Model as a teaching tool for watershed overview, point and non-point source pollution and student insights
- [www.coastal-watershed.org](http://www.coastal-watershed.org) (contains a GO! Program page that includes a link to student data gathered during the course of the school year.)
- Water quality monitoring equipment and Standard Operating Procedures "SOP's" (equipment instructions)
- Student journals
- Mid-program and final student evaluation (see example)
- Other lessons: pH experiments, BMI studies, water sampling

## Highlights:

- Watershed Festival (display and demo's of student lessons, activities and water quality monitoring)
- Life Lab Erosion Project
- Graphing Project – parameter correlation (utilizing student data results)
- Litter display at Festival from trash collected at creek monitoring sites during the school year
- Nature Study observations and journaling
- Students performed well in the field with equipment
- Students gained a feeling of “stewardship” through trash/habitat clean up

## Evaluation Highlights

- Exam results good overall – with increasing knowledge over the course of the year:
- Students identified monitoring equipment well and demonstrated a high level of understanding of pollution sources, ways to reduce pollution and the effect of pollution in watersheds
- Exams revealed students need further lessons on substrates, flora & fauna and how to express definition of “watersheds”
- Students demonstrated a high level of interest and excitement in the program

## **Changes Made – Tools & Methods**

- Redesigning the exams with clearer language that better addresses the needs of multiple grade levels and types of learners in the classroom.
- Increase and improve classroom lesson plans to better address substrate, flora, fauna, watershed definition, and human relationships to water quality
- Increasing staff for classroom and field activities at Valencia (year two) and Landmark School (pilot year) in the 2007-2008 school year
- Decreasing student numbers at Valencia by addressing 5<sup>th</sup> and 6<sup>th</sup> grade students only

## **Changes Made - Program**

- During the first two months in the field at Valencia: working with two parameters at a time (rather than six) to better address each parameter, relationship to water quality & correlation between parameters
- Creating new lessons at Landmark School that give improved ecosystem/watershed overviews to students. Examples include: Web of Life game, The Life Box, Migration Headache Game, Slough Water Study (identifying plants, aquatic organisms & general observations), Watershed Wrap-Up (includes rotation activities: water cycle, web of life, NPS pollution, water conservation & permeable/non-permeable surfaces)